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ABSTRACT

Problems of duplex investment are noted in the introduction to this booklet designed to provide a technique by which the investment decision can be approached, develop estimates of typical costs and returns under differing conditions, and encourage investors to analyze objectives and conditions before the decision to buy or build is made. A computer data analysis of a number of different cases is reported in order to provide typical terms, operating expenses, and benefits of a relatively new duplex in today's market. (HD)

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CONSIDERATIONS IN DUPLEX INVESTMENT

By

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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By

*Arthur Wright and Tom Goen**

Duplexes recently have gained increasing popularity in Texas. Last year, approximately 2,425 units were built in the state, an increase of 88 percent over 1975 and 95 percent over the 1974 levels. Of the 25 SMSA's in the state, 11 experienced an increase of 50 percent or more in duplex construction rates in 1976 over the preceding year.

The Problem

A variety of conditions have contributed to this increased interest in duplex housing. The lower cost of duplex construction makes it one of the few forms of home ownership that many young couples can afford. By renting out half of the structure, they can reduce their shelter cost, improve their cash flow and enjoy many of the benefits of home ownership.

The parent with a child in college or recently married may see the duplex as a means of minimizing the housing cost of a son or daughter for a few years.

Duplexes offer a far less crowded lifestyle than apartment complexes. Increased privacy and freedom add greatly to the attraction of a duplex home. It might be considered the next best thing to a single-family home.

Real estate investors see duplex homes as an investment vehicle and tax shelter. Tax advantages and financial conditions encourage a great deal of construction which would otherwise be infeasible financially.

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The "handyman" investor can further enhance returns by managing and maintaining such a property in his spare time.

Unfortunately, many people are buying or building duplexes today without full knowledge of (a) what their real objectives for the duplex are, (b) how well the duplex will satisfy their need, (c) normal operating costs and revenues to expect or (d) how to analyze the capabilities of the duplex to meet their financial goals.

Objectives and Methodology

This publication attempts to clarify the above problems by (a) providing a technique by which the investment decision can be approached, (b) developing estimates of typical costs and returns under differing conditions and (c) encouraging investors to analyze objectives and conditions BEFORE the decision to buy or build is made.

Because many situations exist for each individual investor, various conditions have to be considered. A changing rental market for duplexes, rising maintenance costs, rapidly appreciating real estate values and the individual investor's tax situation add greatly to the amount of data needed for a thorough study. For this reason, a computer model was used to analyze data for a number of different cases.

The hypothetical situation used in the initial computer runs involved a duplex structure with each unit containing 1,000 square feet, building cost of $18 per square foot and land cost of $5,000. The total cost was $41,000. Expected occupancy was held at 95 percent. Depreciation was figured on double declining balance, with a depreciable life of 25 years. The property was to be held for seven years and then sold. The project was financed with an 80 percent first mortgage of $32,800 at 9 3/4 percent interest for 25 years and a 10 percent second mortgage of $4,100 at 9 3/4 percent interest for seven years. The initial down payment was 10 percent, or $4,100, upon which the owner wanted to receive a 20 percent return upon his

investment.

Rental rates of $225 and $250 per month were used with a 5 percent annual growth in rental rates. The ratio of operating expenses to total income was varied from 20 percent to 30 percent to cover insurance, taxes, management, maintenance and repairs. Marginal income tax brackets of 25 percent and 35 percent were assumed with capital gains taxes calculated at half the rate of the income tax bracket. Annual property value appreciation rates of 9 percent and 5 percent were used.

The numerous variables involved resulted in the initial analysis of 16 different cases. Two additional cases were then considered to reflect slightly more realistic situations in the actual markets. These cases used $225 monthly rental rates with a 5 percent annual growth rate. Occupancy for one was held at 95 percent while the other was allowed only 90 percent. Operating costs were started in the first year at 20 percent of total rental income with a yearly increase of 11 percent in the first-year figure. The annual property value appreciation rate was 5 percent, and the marginal income tax was figured for the 35 percent bracket for both cases. All other factors were identical to the first 16 cases.

The following six criteria were used to determine the financial soundness of each case.

1) Debt coverage ratio -- indicates the ability of the project to service its debts independent of outside resources and is computed by dividing net income by the amount of annual debt service (i.e. principal and interest payments). Lenders generally like for this ratio to be at least 1.3, meaning net income should be at least 30 percent larger than the principal and interest payments.

2) Cash flow before tax -- actual dollars-and-cents return of the project to the owner after operating expenses and mortgage principal and interest payments have been made.

3) Cash flow after tax -- returns of the project after tax considerations.

4) Net proceeds for sale -- cash proceeds to be expected from the sale of the property at the end of the holding period, after all expenses have been allowed for.

5) Discounted net present value (DNPV) -- the present worth of all future benefits and costs from the project after discounting them at a specified rate of return. A 10 percent rate was used in these examples. The larger this value the more advantageous the investment. Projects with a negative value should not be purchased.

6) Internal rate of return (IRR) -- the rate of return (or discount) that equates all future net cash flows to the initial cash investment. The higher the rate, the better the investment.

Results

In summarizing the results of the initial 16 cases, only the worst, best and most realistic cases are presented.

(1) Worst Case -- $225 monthly rent, 30 percent operating expenses, 35 percent tax bracket, zero percent property value appreciation, 10 percent discount rate.

Criteria	Year of Holding Period						
	1	2	3	4	5	6	7
Debt Coverage Ratio	.81	.87	.94	1.02	1.07	1.14	1.22
Cash Flow Before Tax	$(808)	(552)	(282)	1	297	609	937
Cash Flow After Tax	219	278	349	432	527	632	748
Net Proceeds From Sale	- -						$5,454
Discounted Net Present Value	- -						(1,159)
Internal Rate of Return:							
(a) Total Capital	- -						7.84%
(b) Initial Equity	- -						13.21%

(2) Best Case -- $250 monthly rental rate, 20 percent operating expenses, 35 percent tax bracket, 5 percent property value appreciation, 10 percent discount rate.

Criteria	Year of Holding Period						
	1	2	3	4	5	6	7
Debt Coverage Ratio	1.04	1.11	1.18	1.25	1.33	1.41	1.49
Cash Flow Before Tax	$182	467	766	1080	1410	1757	2120
Cash Flow After Tax	$863	940	1031	1134	1250	1378	1517
Net Proceeds from Sale	- -						$18,398
Discounted Net Present Value	- -						4,937
Internal Rate of Return:							
(a) Total Capital	- -						12.87%
(b) Initial Equity	- -						39.80%

As these tables show, debt coverage ratios for all cases were rather low, especially in the $225 rental rates and 30 percent operating expense categories. With $250 rental rates and lower operating expenses, the debt coverage ratio is much more attractive but is still a bit low in the earlier years from a lender's point of view.

None of the investment criteria are favorable for the worst case. The debt coverage is inadequate during the entire seven-year period and less than one for the first three years which means the project would not generate enough income to retire its debts. Also with the $225 rental rate, the cash flow becomes a problem. Even with operating expenses reduced to 20 percent, cash "feeding" is required for the first two years, and tax benefits are meager at best. A property value growth rate of 5 percent greatly enhances net proceeds from sale and results in a $5,454 profit from the sale of the project. However, after the time value of money is considered by way

of the net discounted present value technique, the project is shown to produce a loss of $1,159. Based upon this criterion, a project should be bought only if the DNPV is greater than zero; the more, the better. The internal rate of return (IRR) criteria for this case is also undesirable. Many investors would insist upon at least 18 percent on the equity ratio before they would be interested.

The results are much more favorable for the best case. The low down payment causes the debt coverage ratio to still be inadequate during the first three years. However, it improves quickly and, with support of the other criteria, should not be considered too serious. The cash flow is greatly improved and the tax benefits ensure a good return even if operating expenses are raised to 30 percent. The net proceeds from the sale of nearly $18,400 are quite attractive, and even after allowing for the opportunity cost of money, the DNPV criteria shows the venture would produce a $4,937 gain. The IRR on equity for the best case of 39.8 percent is extremely favorable.

(3) Most Realistic Cases -- In order to make the analysis more comprehensive, two additional cases were considered to show the effect of lowered occupancy rates and steadily increasing operating expenses through the years. These cases include the lower $225 rental rate, 5 percent annual property appreciation and operating expenses of 20 percent the initial year plus an 11 percent increase of each year thereafter. A 35 percent income tax was used in both cases while case one enjoys 95 percent occupancy and case two slips to a 90 percent occupancy level. The results were as follows:

Criteria	Year of Holding Period						
	1	2	3	4	5	6	7
Debt Coverage Ratio							
95% Occupancy	.94	.97	1.00	1.03	1.06	1.10	1.12
90% Occupancy	.88	.90	.93	.96	.99	1.02	1.04
Cash Flow Before Tax							
95% Occupancy	(268)	(130)	7	143	278	409	537
90% Occupancy	(538)	(414)	(291)	(169)	(50)	65	175
Cash Flow After Tax							
95% Occupancy	570	553	538	535	524	503	488
90% Occupancy	395	368	344	322	301	278	253
Net Proceeds from Sale							
95% Occupancy							$18,398
90% Occupancy							18,398
Discounted Net Present Value							
95% Occupancy							$ 2,968
90% Occupancy							2,258
Internal Rate of Return on:							
(a) Total Capital							
95% Occupancy							11.58%
90% Occupancy							11.12%
(b) Initial Equity							
95% Occupancy							31.90%
90% Occupancy							28.92%

The preceding table shows that a steadily increasing operating expense ratio seriously affects the cash-flow conditions of the project. However, the occupancy level is even more important. A drop in the occupancy rate from 95 to 90 percent results in a negative-cash-flow-before-tax situation for five years in the seven-year holding period, while the debt coverage ratio was inadequate in both cases due to the low rental rate. In spite of the cash-flow problem before taxes, the after-tax situation is favorable in both cases. The favorable DNPV and IRR figures indicate a good return would be earned during the holding period due to inflation and appreciation.

Conclusions

The various forms of housing ownership suit various needs and objectives. However, many times a property is purchased before the objectives are clearly identified and calculations are made to see if the property can fulfill these objectives.

The reasons why people buy a duplex vary from a lack of knowledge regarding potential cost and benefits to trying to achieve minimum shelter cost, to maximizing returns to the investor. This publication provides typical terms, operating expenses and benefits of a relatively new duplex in today's market.

Many factors affect the overall success of the purchase. The occupancy level, operating expense rates and tax considerations are very important influences upon short-run, cash-flow conditions. In the long run, the rate of property appreciation and general inflation tend to be the more important considerations. Thus, many larger investors are willing to accept a project with a very low or negative cash flow if they can obtain an adequate appreciation rate in the long run.

For the individual who is going to live in part of the duplex structure or the small investor, the objectives and requirements may be quite different. Each person must recognize his own objectives and then decide if the property satisfies his particular situation.